

Remarks

Claims 1-62 are pending in the application. Claims 59-62 have been withdrawn from consideration. Claims 1-58 stand rejected.

Claims 8, 11-27, 30, 31, 33, 34, 36-53, 55-57, and 59-62 have been canceled by the present Amendment. Claims 1, 2-6, 9, 10, 28, 29, 32, 35, 54, and 58 have been amended. New claims 63-73 have been added. Support for the Amendment to claim 1 can be found throughout the specification, for example, in paragraphs 68, 76, 86, 101, 120, 133, 162, 164, 229, 259, 297, and 315. Claims 2-6, 9, 10, 28, 29, 32, 35, 54, and 58 have been amended to correct the dependencies of those claims. Claims 1, 5, 6, 28, 32, 35, 54, and 58 have been amended to clarify the language used in those claims. Support for new claim 64 can be found in paragraphs 6 and 86. Support for new claims 63, 64, and 66-72 can be found throughout the specification and in original claims 36-41. Support for new claim 73 can be found throughout the specification, for example, in paragraphs 120, 122, and 132.

No new matter has been added by the present Amendment. Applicant specifically reserves the right to pursue the subject matter of the canceled or amended claims in a related application. The present Amendment is introduced for the sole purpose of furthering prosecution. Applicant respectfully requests reconsideration of the case in light of the present Amendment and the following Remarks. Each of the rejections levied in the Office Action is addressed individually below.

Title of the Invention

The present application was filed as a § 371 national phase entry of PCT application serial number PCT/US04/20529, filed June 24, 2004 (“the ‘529 application”). The ‘529 application was published on January 13, 2005 as PCT publication WO 05/003730 (“the ‘730 publication”). The present application was published on May 3, 2007, as United States patent publication number 2007/0099233 (“the ‘233 publication”).

Applicant notes that the first page of the ‘233 publication indicates that the title of the present invention is “Cross-Reference,” a copy of which is attached to this Response as Appendix A. Applicant respectfully submits that the title of the invention is not “Cross-Reference,” and that a mistake was made during the publication of the present application. The first page of the ‘730 publication, the first page of the § 371 transmittal of the present

application, and the first page of the specification of the present application are attached to this Response as Appendix B. All three of these documents clearly indicate that the title of the invention is not “Cross-Reference,” but instead, is “Sensors.” This was the USPTO’s error, and was not Applicant’s error. Applicant, therefore, respectfully requests correction of the record and re-publication of the present application with the correct title.

Objection to the Specification

The Examiner has objected to the disclosure on the ground that it fails to provide proper antecedent basis for recitation of “methyaccepting chemosensory receptors” in claims 39-41. The Examiner suggests that Applicants intended to recite “methyl-accepting chemosensory receptors.” While not agreeing with the Examiner, and *solely* in order to further prosecution, Applicant has canceled claims 39-41, and has recited “methyl-accepting chemosensory receptors” in new claims 64, 65, and 68. Applicant, therefore, respectfully submits that the present objection is rendered moot by the present Amendment.

Rejection under 35 U.S.C. § 102(b) for alleged lack of novelty

Claims 1-3, 5-13, 15-23, 25-31, 35, and 51-56 stand rejected under 35 U.S.C. § 102(b) on the ground that they are anticipated by Daniels *et al.* (U.S. Patent Publication 2002/0004246). The Examiner states that Daniels teaches a detection reagent comprising a ligand conjugated to a semiconductor nanocrystal that binds to a first target moiety of an analyte of interest, and a capture agent that binds to a first detection ligand, and that the detection reagent of Daniels anticipates the claims. Applicant respectfully disagrees. However, without agreeing with the Examiner, and *solely* in order to further prosecution, Applicant has amended the claims to specify that the sensing moieties and signaling moieties are polypeptides or polynucleotides. Given that the detection reagent of Daniels involves nanocrystals, and does not involve polypeptides or polynucleotides, Daniels does not teach all of the elements of the claims and, therefore, does not anticipate the claims. Applicant, therefore, respectfully requests that the rejection be removed.

Claims 1, 2, 5, 6, 8, 9, 11, 12, 15, 16, 19, 21, 22, 25, 26, 35-39, 48, 49, 52, and 54-56 stand rejected under 35 U.S.C. § 102(b) on the ground that they are anticipated by Blau *et al.* (U.S. Patent Publication 2002/0048778). The Examiner states that Blau teaches an invention for detection of interaction in living cells comprising fluorescein and rhodamine labeled EGF added to cells in order to detect interaction of labeled molecules using fluorescence energy transfer (FRET). The Examiner states that these teachings anticipate the claims. Applicant respectfully disagrees. However, without agreeing with the Examiner, and *solely* in order to further prosecution, Applicant has amended claim 1 to specify that the sensor element is not comprised in a cell. Applicant submits that the Blau teaches cell-based systems, and do not teach cell-free systems. Blau does not teach all of the elements of independent claim 1, and therefore, does not anticipate claim 1 or its dependents.

Applicant has also added new claim 63, which specifies that at least one signaling moiety comprises a methyl-accepting chemosensory receptor or a portion thereof. Blau teaches systems based on the EGF receptor, and do not make any mention of systems involving methyl-accepting chemosensory receptors. Blau does not teach all of the elements of independent claim 63, and therefore, does not anticipate claim 63 or its dependents.

For all of these reasons, Applicant, therefore, respectfully requests that the rejection be removed.

Rejection under 35 U.S.C. § 103(a) as allegedly being obvious

Claims 4, 14, and 24 stand rejected under 35 U.S.C. § 103(a) on the ground that they are unpatentable over Daniels *et al.* in view of Lesley (U.S. Patent Publication 2002/009740).

Claims 32-34 stand rejected under 35 U.S.C. § 103(a) on the ground that they are unpatentable over Daniels *et al.* in view of Sprecher *et al.* (U.S. Patent Publication 2003/0096339).

Claims 40-43, 45, 46, 48, 49, 50, and 57 stand rejected under 35 U.S.C. § 103(a) on the ground that they are unpatentable over Daniels *et al.* in view of Wun *et al.* (U.S. Patent 5,733,736).

Claim 44 stands rejected under 35 U.S.C. § 103(a) on the ground that it is unpatentable over Daniels *et al.* in view of Wun *et al.* (as applied to claim 43), and further in view of Wang *et al.* (U.S. Patent Publication 2001/0051855).

Claim 47 stands rejected under 35 U.S.C. § 103(a) on the ground that it is unpatentable over Daniels *et al.* in view of Wun *et al.* (as applied to claim 40), and further in view of Lesley.

Claim 58 stands rejected under 35 U.S.C. § 103(a) on the ground that it is unpatentable over Daniels *et al.* in view of Wun *et al.* (as applied to claim 40), and further in view of Kelso (U.S. Patent Publication 2003/0129296).

All of the § 103 rejections are based on Daniels *et al.* in combination with one or more secondary references. The deficiencies of Daniels *et al.* are described above. Applicant respectfully submits that none of the secondary references remedy the defects of Daniels *et al.* None of these references, alone or in combination, renders the presently amended claims obvious. Applicant, therefore, respectfully requests that the rejection be removed.

Conclusion

For all of the reasons set forth above, each of the rejections in this case should be removed and the application should proceed to allowance. A Notice to that effect is respectfully requested.

If, at any time, it appears that a phone discussion would be helpful, the undersigned would greatly appreciate the opportunity to discuss such issues at the Examiner's convenience. The undersigned can be contacted at (617) 248-5175.

Please charge any fees that may be required for the processing of this Response, or credit any overpayments, to our Deposit Account No. 03-1721.

Respectfully submitted,

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APPENDIX A



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(54) **CROSS-REFERENCE**

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(2), (4) Date: **Dec. 22, 2005**

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(52) **U.S. Cl.** **435/7.1; 435/287.2**

(57) **ABSTRACT**

The invention provides sensors that are useful for detecting and measuring chemical characteristics and physical properties of compositions containing analytes. The invention further provides, among other things, methods for making the sensors and for using them, as well as modified cells having sensors of the invention therein.

APPENDIX B

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

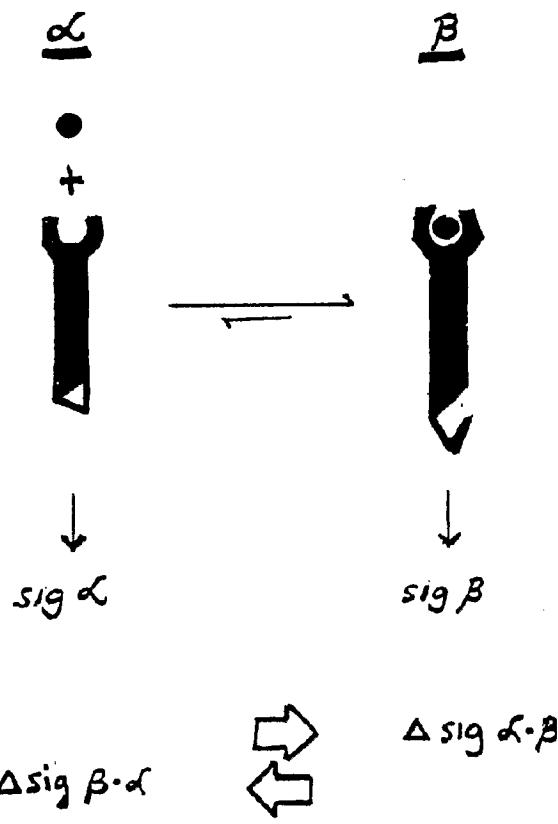
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[Continued on next page]

(54) Title: SENSORS



WO 2005/003730 A2



(57) Abstract: The invention provides sensors that are useful for detecting and measuring chemical characteristics and physical properties of compositions containing analytes. The invention further provides, among other things, methods for making the sensors and for using them, as well as modified cells having sensors of the invention therein.

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| | | |
|---|--|--|
| TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A SUBMISSION UNDER 35 U.S.C. 371 | | ATTORNEY'S DOCKET NUMBER 18016-20 |
| INTERNATIONAL APPLICATION NO. PCT/US2004/020529 | INTERNATIONAL FILING DATE June 24, 2004 | U.S. APPLICATION NO. (Unknown, see 37 CFR 1.5) 10/561828 |
| TITLE OF INVENTION Sensors | | |
| APPLICANT(S) FOR DO/EO/US Jeffry B. Stock | | |
| Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information: | | |
| <p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a submission under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a submission under 35 U.S.C. 371.</p> <p>3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.</p> <p>4. <input checked="" type="checkbox"/> The US has been elected (Article 31).</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ul style="list-style-type: none"> a. <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> has been communicated by the International Bureau. c. <input checked="" type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). </p> <p>6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)). <ul style="list-style-type: none"> a. <input type="checkbox"/> is attached hereto. b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4). </p> <p>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ul style="list-style-type: none"> a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> have been communicated by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input checked="" type="checkbox"/> have not been made and will not be made. </p> <p>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</p> <p>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p> | | |
| Items 11 to 20 below concern document(s) or information included: | | |
| <p>11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</p> <p>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input type="checkbox"/> A preliminary amendment.</p> <p>14. <input type="checkbox"/> An Application Data Sheet under 37 CFR 1.76.</p> <p>15. <input type="checkbox"/> A substitute specification.</p> <p>16. <input checked="" type="checkbox"/> A power of attorney and/or change of address letter.</p> <p>17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 37 CFR 1.821- 1.825.</p> <p>18. <input type="checkbox"/> A second copy of the published International Application under 35 U.S.C. 154(d)(4).</p> <p>19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).</p> | | |

This collection of information is required by 37 CFR 1.414 and 1.491-1.492. The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 15 minutes to complete, including gathering information, preparing, and submitting the completed form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

SENSORS

CROSS-REFERENCE

[0001] This application claims priority to U.S. Provisional Patent Application
5 60/483,011 filed June 27, 2003, which is incorporated herein by reference in its entirety.

BACKGROUND

[0002] Sensor technology is pervasive. Familiar mechanical deployments of sensors include, to name just a few, simple thermostats, humidity and temperature sensors in HVAC systems and appliances, sensors in engine control systems, sensors that trigger air bags to inflate, sensors in process control systems, infrared and motion sensors in security devices, smoke, CO, and natural gas sensors in safety warning devices, and photosensors in photosensitive light switches and automatic door openers.
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[0003] Sensors also have been deployed in a variety of more specialized, perhaps less familiar applications, that include their use in medical monitoring equipment, in devices
15 that control the delivery of fluids to patients, in sophisticated diagnostic assay systems used in clinical laboratories, and in complex instrumentation used in virtually every research endeavor and every technology development project.

[0004] In these, and in most other applications, present day sensors generally are
20 limited to sensing reliably and accurately a single environmental variable, and are based on changes in a mechanical and/or electrical property of a material reliably induced by changes in the environmental variable of interest. Changes in temperature cause mechanical change (expansion and contraction) in the metals that make up the bi-metallic coil of certain types of thermostat, for instance. In household smoke alarms, particles in smoke reduce the radiation reaching a collector and thereby change the electrical properties of the collector.
25 When the change exceeds a preset threshold, the alarm goes off. More sophisticated sensors make similar use of laser beams, motion detectors, miniature accelerometers and the like, including those used in chemical process controllers.

[0005] The sensors in widespread use generally respond to physical phenomena:
30 they are not chemosensors. Indeed, even sensors employed to monitor chemical process variations generally do so by monitoring a physical variable, such as color depth, reflectivity, or polarization. Clinical laboratory assay devices employed to recognize specific chemical species are a notable exception; but, clinical laboratory analyzers typically